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Registration Decision

RD2010-07

Mesosulfuron-methyl

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Registration Decision for Mesosulfuron-methyl

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act* and Regulations, is granting full registration for the sale and use of Mesosulfuron-methyl Technical Herbicide and Silverado WDG Herbicide containing the technical grade active ingredient Mesosulfuron-methyl to control wild oats in spring and durum wheat.

An evaluation of available scientific information found that, under the approved conditions of use, the product has value and does not present an unacceptable risk to human health or the environment.

These products were first proposed for registration in the consultation document¹ Proposed Registration Decision PRD2010-01, *Mesosulfuron-methyl*. This Registration Decision² describes this stage of the PMRA's regulatory process for Mesosulfuron-methyl and summarizes the Agency's decision, the reasons for it and provides, in Appendix I, a summary of comments received during the consultation process as well as the PMRA's response to these comments. This decision is consistent with the proposed registration decision stated in PRD2010-01.

For more details on the information presented in this Registration Decision, please refer to the Proposed Registration Decision PRD2010-01, *Mesosulfuron-methyl* that contains a detailed evaluation of the information submitted in support of this registration.

What Does Health Canada Consider When Making a Registration Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable³ if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions of registration. The Act also requires that products have value⁴ when used according to label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

To reach its decisions, the PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (for example, children) as well as organisms in the environment (for example, those most sensitive to environmental contaminants). These methods and policies also consider the

¹ "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act*.

² "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act*.

³ "Acceptable risks" as defined by subsection 2(2) of *Pest Control Products Act*.

⁴ "Value" as defined by subsection 2(1) of *Pest Control Products Act*: "...the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (a) efficacy; (b) effect on host organisms in connection with which it is intended to be used; and (c) health, safety and environmental benefits and social and economic impact".

nature of the effects observed and the uncertainties when predicting the impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the Pesticides and Pest Management portion of Health Canada's website at healthcanada.gc.ca/pmra.

What is Mesosulfuron-methyl?

Silverado WDG Herbicide (containing the active ingredient mesosulfuron-methyl) is a postemergent herbicide, i.e., a herbicide applied after the crop has emerged from the ground. It is applied to spring and durum wheat using ground application equipment to control wild oats.

Silverado WDG herbicide contains the active ingredient mesosulfuron-methyl which belongs to the sulfonylurea family of herbicides and is classified as a Group 2 Herbicide. The primary mode of action of mesosulfuron-methyl is to block the enzyme acetohydroxyacid synthase (AHAS). Without this enzyme weeds typically die within 4 to 6 weeks after application.

Health Considerations

Can Approved Uses of Mesosulfuron-methyl Affect Human Health?

Mesosulfuron-methyl is unlikely to affect your health when used according to label directions.

Potential exposure to mesosulfuron-methyl may occur through the diet (food and water) or when handling and applying the product. When assessing health risks, two key factors are considered: the levels where no health effects occur and the levels to which people may be exposed. The dose levels used to assess risks are established to protect the most sensitive human population (for example, children and nursing mothers). Only uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

Toxicology studies in laboratory animals describe potential health effects from varying levels of exposure to a chemical and identify the dose where no effects are observed. The health effects noted in animals occur at doses more than 100-times higher (and often much higher) than levels to which humans are normally exposed when mesosulfuron-methyl products are used according to label directions.

The technical grade active ingredient mesosulfuron-methyl was of low acute oral and dermal toxicity and of slight toxicity by the inhalation route in rats. It was not irritating when applied to the skin of the rabbit but was minimally irritating to the rabbit eye. Mesosulfuron methyl was not a skin sensitizer in the guinea pig.

The formulation Silverado WDG Herbicide containing 2.26% of the technical active ingredient, mesosulfuron-methyl was of low acute toxicity via the oral, dermal and inhalation routes. It was minimally irritating to the skin but moderately irritating to the eye of the rabbit. Similar to the active ingredient, it was not a skin sensitizer.

Mesosulfuron-methyl did not cause cancer in animals and did not damage genetic material (DNA). There was also no indication that mesosulfuron-methyl caused damage to the nervous system and there were no adverse effects on the reproduction system. The first signs of toxicity in animals given daily doses of mesosulfuron-methyl over longer periods of time were effects in the stomach. The risk assessment protects against these effects by ensuring that the level of human exposure is well below the lowest dose at which these effects occurred in animal tests.

When mesosulfuron-methyl was given to pregnant animals, no treatment related effects on the developing foetus or the mother were observed up to the limit dose, indicating that the foetus is not more sensitive to mesosulfuron-methyl than the adult animal. Because of this observation, extra protective factors were not warranted for risk assessment.

Residues in Water and Food

Dietary risks from food and water are not of concern.

Aggregate dietary intake estimates (food plus water) revealed that the general population and infants, the subpopulation which would ingest the most mesosulfuron-methyl relative to body weight, are expected to be exposed to less than 1% of the acceptable daily intake. Based on these estimates, the chronic dietary risk from mesosulfuron-methyl is not of concern for all population sub-groups. Mesosulfuron-methyl is not carcinogenic; therefore, a cancer dietary exposure assessment is not required.

A single dose of mesosulfuron-methyl is not likely to cause acute health effects in the general population (including infants and children). An acute reference dose was not established, therefore an acute dietary intake estimate is not required.

The *Food and Drugs Act* prohibits the sale of adulterated food, that is, food containing a pesticide residue that exceeds the established maximum residue limit (MRL). Pesticide MRLs are established for *Food and Drugs Act* purposes through the evaluation of scientific data under the *Pest Control Products Act*. Food containing a pesticide residue that does not exceed the established MRL does not pose an unacceptable health risk.

Residue trials conducted throughout the United States using mesosulfuron-methyl on wheat were acceptable. The MRLs for this active ingredient can be found in the Science Evaluation of the Proposed Registration Decision for mesosulfuron-methyl (PRD 2010-01).

Occupational Risks From Handling Mesosulfuron-methyl

Occupational risks are not of concern when Silverado WDG Herbicide is used according to the label directions, which include protective measures.

Farmers and pesticide applicators mixing, loading or applying Silverado WDG Herbicide as well as field workers re-entering freshly treated wheat fields can come in direct contact with Silverado WDG Herbicide on the skin or through inhalation of spray mists.

Therefore, the label will specify that anybody who is handling Silverado WDG Herbicide must wear a long-sleeved shirt, long pants, chemical resistant gloves and shoes plus socks during mixing, loading, clean-up and repair. In addition, the label will also specify to wear goggles or face shield during mixing/loading and for applicators to wear long-sleeved shirt, long pants and shoes plus socks.

Taking into consideration these label requirements and that occupational exposure is expected to be short to intermediate term, because this herbicide can only be applied once per season to any given field, risk to farmers, applicators or workers is not a concern.

For bystanders, exposure is expected to be much less than that of field workers and is considered negligible. Therefore, health risks to bystanders are not of concern.

For post-application, exposure is expected to be minimal since Silverado WDG Herbicide is applied directly to the ground using a groundboom sprayer shortly after it has been planted. Therefore, health risks to workers entering treated fields are not of concern.

Environmental Considerations

What Happens When Mesosulfuron-methyl is Introduced Into the Environment?

Mesosulfuron-methyl and its transformation products are non-persistent to moderately persistent in the environment (terrestrial and aquatic). The potential of these chemicals to reach groundwater is minimal. Mesosulfuron-methyl is expected to impact terrestrial plants, therefore, buffer zones are needed for the protection of non-target plants.

Mesosulfuron-methyl is transformed by micro-organisms in soil and aquatic systems. In soil, mesosulfuron-methyl is non-persistent to moderately persistent and its transformation products are not expected to be persistent. Adsorption studies indicate mesosulfuron-methyl has relatively high soil mobility. However, a field dissipation study did not detect the herbicide below 30 cm. Leaching of mesosulfuron-methyl into ground water is, therefore, not expected to be a major route of contamination under Canadian wheat growing conditions. This is supported by the results of groundwater modelling scenarios. In aquatic systems, mesosulfuron-methyl is non-persistent to moderately persistent. Mesosulfuron-methyl and its transformation products are unlikely to accumulate in sediments as they transform rapidly under anaerobic conditions.

Mesosulfuron-methyl does not present a risk to earthworms, bees, birds, small mammals, fish, aquatic vascular plants, aquatic invertebrates and algae. As a herbicide, mesosulfuron-methyl poses a risk to non-target terrestrial plants. Precautionary statements are thus included on the end-use product (Silverado WDG Herbicide) label and buffer zones of 1 metre (terrestrial habitats) are required to mitigate risk to non-target plants from spray drift.

Value Considerations

What Is the Value of Silverado WDG Herbicide?

Silverado WDG Herbicide, a postemergence herbicide, controls wild oats in wheat (spring and durum).

A single application of Silverado WDG Herbicide provides effective control of wild oats in spring and durum wheat. Silverado WDG Herbicide is compatible with integrated weed management practices, conservation tillage, and conventional crop production systems. Silverado WDG Herbicide is applied after weed emergence, allowing growers to better assess whether the herbicide is suitable for the particular weed species present.

Measures to Minimize Risk

Registered pesticide product labels include specific instructions for use. Directions include risk-reduction measures to protect human and environmental health. These directions must be followed by law.

The key risk-reduction measures on the label of Silverado WDG Herbicide to address the potential risks identified in this assessment are as follows.

Key Risk-Reduction Measures

Human Health

Because there is a concern with users coming into direct contact with Silverado WDG Herbicide on the skin or through inhalation of spray mists, anyone mixing, loading and applying Silverado WDG Herbicide must wear appropriate personal protective equipment.

Wear a long-sleeved shirt, long pants, chemical resistant gloves and shoes plus socks during mixing, loading, clean-up and repair. In addition, wear goggles or face shield during mixing/loading. Applicators must wear long-sleeved shirt, long pants and shoes plus socks.

In addition, standard label statements to protect against drift during application were added to the labels.

Environment

A hazard statement was added to the product label because of the end-use product's toxicity to non-target terrestrial plants. Buffer zones of 1 metre (terrestrial habitats) are required for their protection.

Other Information

1. The relevant test data on which the decision is based (as referenced in this document) are available for public inspection, upon application, in the PMRA's Reading Room (located in Ottawa). For more information, please contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.infoserv@hc-sc.gc.ca).
2. Any person may file a notice of objection⁵ regarding this registration decision within 60 days from the date of publication of this Registration Decision. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Health Canada's website (Request a Reconsideration of Decision, www.hc-sc.gc.ca/cps-spc/pest/part/protect-proteger/publi-regist/index-eng.php//rrd) or contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.infoserv@hc-sc.gc.ca).

⁵ As per subsection 35(1) of the *Pest Control Products Act*.

Appendix I Comments and Responses

1) Comments on the toxicity profile of Technical Mesosulfuron-methyl and addition of supporting documentation to the Reference List.

Two comments were received regarding the incorrect citation of the PMRA reference numbers and the omission of PMRA document numbers in the Reference list.

Response:

The Reference List has been revised and corrected in the document. All original data that was reviewed in support of this decision has now been included in the Reference List in this document.

2) Comment on the Nature of the Residue in Laying Hen.

A comment was received in regards to the calculation of total radioactive residue (TRR) values for egg white and yolk in Table: The Nature of the Residue in Laying Hen, Rows 9 and 10 on p. 36.

Response:

The PMRA concurs and the TRR values have been corrected to 0.011 ppm for Egg Whites (Day 8) and 0.012 ppm for Egg Yolks (Day 10).

3) Comment on the Toxicity to Non-target Species, Mallard Duck

A comment was received in regards to the incorrect LD50 value for a 5 day acute dietary study.

Response:

The PMRA concurs and the LD₅₀ value has been corrected to >1210 mg ai/kg bw/day.

References

A. List of Studies/Information Submitted by Registrant

1.0 Chemistry

PMRA No.	Title
1436929	2001, Description of the manufacturing process of the technical AI Mesosulfuron-methyl Coe: AE F130060, DACO: 2.11.1,2.11.2,2.11.3 CBI
1436930	2000, Discussion of the formation of impurities Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.11.4 CBI
1436931	2000, Analytical profile of five preliminary production batches Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.12.1,2.13.3 CBI
1436932	2000, Validation of the analytical method to determine AE F130060 in technical and pure mesosulfuron Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.13.1 CBI
1436933	2000, Validation of the analytical method AL065/96-3 to determine the organic impurities of AE F130060 in technical and pure mesosulfuron Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.13.1 CBI
1436934	2000, Validation of the analytical methods AL103/99-0 for the determination of [CBI REMOVED] and AL082/99-0 for the determination of [CBI REMOVED], DACO: 2.13 CBI
1436935	2000, Validation of the analytical method AL102/99-0 for the determination of AE F130060 (mesosulfuron), [CBI REMOVED] in AE F130060 02 WG15 A4, AE F130060 00 WG75 A1, AE F130060 02 WG13, DACO: 2.13.1 CBI
1436936	2000, Determination of the organic impurities in technical grade and pure active ingredient by HPLC (Analytical method) Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.13.1,2.13.2 CBI
1436937	2000, Analytical method Determination of [CBI REMOVED] in AE F130060 active ingredient technical by gas chromatography (GC) Code, DACO: 2.13.1, 2.13.2 CBI
1436938	2000, Determination of AE F130060 in technical grade and pure active ingredient by HPLC (Analytical method) Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.13.1,2.13.2 CBI

- 1436939 2000, Analytical method Determination of [CBI REMOVED] in AE F130060 active ingredient technical by gas chromatography (GC) Code: AE F130060, DACO: 2.13.1,2.13.2 CBI
- 1436940 2000, Determination of the colour AE F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.14.1
- 1436941 1997, The acid dissociation constant of Hoe 130060, DACO: 2.14.10
- 1436942 1997, The n-Octanol/Water Partition Coefficient of Hoe 130060, DACO: 2.14.11
- 1436943 2000, Spectral data (UV / VIS, IR, ¹H-NMR, ¹³C-NMR, MS) and molar extinction coefficient Mesosulfuron (proposed ISO) technical grade active ingredient Code: AE F130060, DACO: 2.14.12
- 1436944 2000, Stability AE F130060, DACO: 2.14.13
- 1436945 2005, Stability of mesosulfuron technical, DACO: 2.14.14
- 1436947 2000, Determination of the physical state AE F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.14.2
- 1436948 2000, Determination of the odour AE F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.14.3
- 1436949 2000, Melting point / melting range. Boiling point / boiling range. Thermal stability. Explosive properties AE F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.14.4,2.14.5
- 1436950 2000, Relative density AE F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.14.6
- 1436951 1996, Report on the solubility of methyl-2-(3-(4,6-dimethoxypyrimidin-2-yl) ureidosulfonyl)-4-methansulfonamidomethyl-benzoate, Hoe 130060, in water and aqueous buffer solutions of pH 4, 5, 7, 9 and 10, DACO: 2.14.7
- 1436952 1996, Report on the solubility of methyl-2-(3-(4,6-dimethoxypyrimidin-2-yl) ureidosulfonyl)-4-methansulfonamidomethyl-benzoate, Hoe 130060, in organic solvents, DACO: 2.14.8
- 1436953 1996, The temperature dependence of the vapour pressure of Hoe 130060, DACO: 2.14.9
- 1436955 1997, AE F130060 substance, technical; AE F130060 00 1C95 0001 - Flammability (solids), DACO: 2.16

- 1436956 2000, Determination of the pH-value Ae F130060 substance, technical Code: AE F130060 00 1C95 0001, DACO: 2.16
- 1436957 2007, Mesosulfuron-Methyl Technical Herbicide - Manufacturers Name and Office Address and Manufacturing Plants Name and Address, DACO: 2.2
- 1633680 2006, Material Accountability of AEF130060 (Mesosulfuron-methyl) Analytical Profile of Five Production Batches from [CBI REMOVED], DACO: 2.11.3,2.13.1,2.13.2,2.13.3 CBI
- 1633681 2005, Statement on the assignment of the structures of the impurities [CBI REMOVED] in technical AE F130060 (mesosulfuron-methyl), DACO: 2.13.2 CBI
- 1633682 safety data sheet, DACO: 2.15
- 1758276 2009, Mesosulfuron-methyl Technical Material ~~and~~ Formation of the Impurities [CBI REMOVED], DACO: 2.11.4 CBI
- 1758277 2005, Analytical Method Determination of the Organic Impurities in Technical Grade and Pure Active Ingredient / HPLC External Standard, DACO: 2.13.1 CBI
- 1758278 2005, Validation of HPLC-Method AM009305FP1 Determination of By-Products in Technical Grade and Pure Mesosulfuron-Methyl by High Performance Liquid Chromatographic (HPLC), DACO: 2.13.1 CBI
- 1758279 2006, 1. Amendment to Report PA99/036 Mesosulfuron-methyl (Technical Grade Active Ingredient) Validation of the Analytical Method AL065/96-3 to Determine the Organic Impurities of AE F130060 in Technical and Pure Mesosulfuron, DACO: 2.13.1 CBI
- 1758280 2006, 1. Amendment to Report PA02/052 Mesosulfuron-methyl (technical grade Active Ingredient) Validation of the Analytical Method AL065/96-3 for the Determination of the Organic Impurities in Technical Grade and Pure AE F130060 by HPLC for the Additional Impurities AE F156657 an AE 0516803, DACO 2.13.1 CBI
- 1758281 2009, Statement on the identity of technical grade Mesosulfuron-methyl (AE F130060) and of organic impurities with regard to DACO 2.13.2 from PMRA (received April 2009), DACO: 2.13.2 CBI
- 1758282 2009, Statement on the identification, assignment and quantification of the organic impurities [CBI REMOVED] in technical grade mesosulfuron-methyl (AE F130060), DACO: 2.13.2,2.13.3 CBI

- 1758284 2009, Statement regarding DACO 2.13.4 from PMRA (received April 2009) concerning Mesosulfuron-methyl technical grade active ingredient, DACO: 2.13.4 CBI
- 1453427 2001, Dissipation of AE F115008 and AE F130060 in soil following application of AE F115008 WDG and AE F122006 WDG or AE F130060 WDG and AE F107982 WDG to a bare plot at the maximum proposed rates, USA, 1998, DACO: 8.2.2.1,8.2.2.2
- 1453429 2007, Analytical Method for Mesosulfuron-methyl In Sediment, DACO: 8.2.2.2
- 1453430 2000, Validation of the enforcement method EM F15/99-0 for surface and drinking water by HPLC-UV Code: AE F130060, DACO: 8.2.2.3
- 1453431 2000, Enforcement method for surface and drinking water by HPLC-UV Code: AE F130060, DACO: 8.2.2.3
- 1633683 2008, Mesosulfuron-methyl Technical Herbicide (Sub. No. 2007-4507) - A Scientific Rationale to address the Analytical Methodology For Soil and Sediment (DACO: 8.2.2.1 and 8.2.2.2), DACO: 8.2.2.1,8.2.2.2
- 1633684 2000, An Analytical Method for the Determination of Residues of AE F130360 in Soil by Liquid Chromatography Using UV Detection and for the Determination of its Metabolite AE F092944 in Soil by Gas Chromatography Using Mass Spectrometric Detection, DACO: 8.2.2.1, 8.2.2.2
- 1633685 2003, Method and Validation: Mesosulfuron-methyl (AE F130060) and its Metabolites AE F154851 and AE F099095 in Soil by LC/MS/MS, DACO: 8.2.2.1,8.2.2.2
- 1758286 2009, Amendment no. 1 to Final Report Method and validation: Mesosulfuron-methyl (AE F130060) and its metabolites AE F154851 and AE F099095 in Soil by LC/MS/MS, DACO: 8.2.2.1
- 1758287 2003, Method and Validation: Mesosulfuron-methyl (AE F130060) and its Metabolites AE F160459 and AE F147447 in Water by LC-MS/MS, DACO: 8.2.2.3
- 1798481 2009, Method and Validation: Mesosulfuron-methyl (AE F130060) and its Metabolites AE F160459 and AE F147447 in Water by LC-MS/MS - Amendment No 1 to Final Report Original 1 of 2, DACO: 8.2.2.3
- 1437132 2007, Silverado WDG Herbicide - Formulating Plant's Name and Address, DACO: 3.1.2

- 1437133 2003, Product chemistry of Silverado herbicide, DACO: 3.1.4,3.2.1,3.2.2,3.3.1,3.4.1,3.4.2,3.5.1,3.5.11,3.5.12,3.5.13,3.5.14,3.5.15,3.5.2,3.5.3,3.5.6,3.5.7,3.5.8,3.5.9 CBI
- 1437134 2000, Determination of AE F130060 (mesosulfuron), [CBI REMOVED] in formulated products by liquid chromatography (HPLC) (analytical method) Code: AE F130060 02 WG15 A4, DACO: 3.4.1 CBI
- 1437135 2000, Validation of the analytical method AL102/99-0 for the determination of AE F130060 (mesosulfuron), [CBI REMOVED] in AE F130060 02 WG15 A4, AE F130060 00 WG75 A1, AE F130060 02 WG13, DACO: 3
- 1437136 2000, Determination of the colour AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.1
- 1437137 2004, Stability of SILVERADO 2% WG, DACO: 3.5.10
- 1437138 2000, Flammability (Solids) AE F130060 water dispersible granule, 75% Code: AE F130060 00 WG75 A103, DACO: 3.5.11
- 1437139 2000, Auto - Flammability (Solids - Determination of relative self-ignition temperature) AE F130060 water dispersible granule 75% Code: AE F130060 00 WG75 A103, DACO: 3.5.11
- 1437140 2000, Explosive properties AE F130060 water dispersible granule 75% Code: AE F130060 00 WG75 A103, DACO: 3.5.12
- 1437141 2000, Determination of the corrosion characteristics AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.14
- 1437142 2000, Determination of the physical form AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.2
- 1437143 2000, Determination of the odour AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.3
- 1437144 2000, Determination of apparent density and tap density AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.6
- 1437145 2000, Determination of the pH-value AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.7
- 1437146 2000, Determination of the oxidizing and reducing properties AE F130060 water dispersible granule 750 g/kg Code: AE F130060 00 WG75 A103, DACO: 3.5.8

2.0 Human and Animal Health

PMRA No.	Title
1453419	2001, Summary of Residues and Plant & Farm Animal Metabolism of Mesosulfuron-Methyl, DACO: 6.1
1453420	2001, Summary of Toxicology and Animal Metabolism of Mesosulfuron-Methyl, DACO: 6.1
1453421	1999, Poultry - Metabolism, distribution and nature of the residues in eggs and edible tissues Code: AE F130060, DACO: 6.2
1453422	1999, Ruminant - Metabolism, distribution and nature of the residues in milk and edible tissues Code: AE F130060, DACO: 6.2
1453423	2000, Metabolism in wheat (<i>Triticum aestivum</i>) following single and double treatment at a nominal application rate of 30 g a.s./ha Each Code: (U-14C-phenyl)-AE F130060, DACO: 6.3
1453424	2001, Metabolism in wheat (<i>Triticum aestivum</i>) following single and double treatment at a nominal application rate of 10 g a.s./ha each Code: (2-14C-pyrimidyl)-AE F130060, DACO: 6.3
1453444	2001, Summary of Residue Analytical Methods for Mesosulfuron-methyl (AE F130060), DACO: 12.7.8.2.2.4
1519725	1999, Poultry - Metabolism, distribution and nature of the residues in eggs and edible tissues, DACO: 6.2
1519726	2000, Metabolism in wheat (<i>Triticum aestivum</i>) following single and double treatment at a nominal application rate of 30 g a.s./ha each, DACO: 6.3
1530194	2007, "Metabolism in Wheat (<i>Triticum aestivum</i>) Following Single and Double Treatment at the Nominal Application Rate of 10 g a.s./ha Each, [2-14C-pyrimidyl]-AE F130060" (Mesosulfuronmethyl), DACO: 6.3
1437155	1999, Data generation method and validation for cereal by LC-MS/MS Code: AE F130060, DACO: 7.2.1
1437156	2001, Aged residue in wheat straw and shoot Radio validation of the residue analytical method EM F 08/99-0 Mesosulfuron-methyl Code: AE F130060, DACO: 7.2.1
1437157	2001, An Analytical Method for the Determination of Residues of AE F130060 in Cereal Crops by Liquid Chromatography Using Mass Spectrometric Detection (MS/MS), DACO: 7.2.1

- 1437158 2000, Enforcement Method for Cereal Grain, Straw and Shoot by LC-MS/MS Amidosulfuron (AE F075032) Metsulfuron-methyl (AE F075735) Iodosulfuron-methyl-sodium (AE F115008) AE F130060 AE F130360, DACO: 7.2.2
- 1437159 2000, Validation of the enforcement method EM F08/99-0 in cereal grain, straw and shoot by LC-MS/MS Code: AE F130060, DACO: 7.2.2
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